

Claims

1. An anchoring device for surgery, comprising first attaching means for attaching the device to an internal surface within the human body and second attaching means for attaching to surgical instruments or devices.
2. The anchoring device according to claim 1, wherein the first attaching means use vacuum to attach to the internal surface within the human body.
3. The anchoring device according to claim 1, wherein the first attaching means use magnetic fields to attach to the internal surface within the human body, and using a magnet or electromagnet on the exterior surface of the cavity, outside of the human body.
4. The anchoring device according to claim 1, wherein the first attaching means use mechanical means such as barbs, fixation wires or a self retaining clamp.
5. The anchoring device according to claim 1, wherein the first attaching means use an inflatable balloon with affixed virtual port devices being secured to two cavity or abdominal walls, and including holding means for attaching to the two cavity or abdominal wall.
6. The anchoring device according to claim 1, wherein the first attaching means use an adhesive attachment means such as a pressure adhesive gel.
7. The anchoring device according to claim 1, wherein the first attaching means include means for attaching to the internal surface of a cavity or to various organs within a cavity, during minimally invasive surgery.
8. The anchoring device according to claim 1, wherein the surgical devices attached to the second attaching means include wires for attaching to another internal surface of a cavity or to various organs within a cavity, to generate a pulling force during minimally invasive surgery.

9. The anchoring device according to claim 1, wherein the surgical devices attached to the second attaching means include rods for attaching to another internal surface of a cavity or to various organs within a cavity, to generate a push away force during minimally invasive surgery.
10. The anchoring device according to claim 1, further including means allowing it to be moved from one position to another and to be reattached to the undersurface of the abdominal wall, or to various tissues within a cavity, without creating any additional openings in the cavity wall.
11. The anchoring device according to claim 1, further including means for attaching a plurality of anchoring devices together for holding a larger weight or for distributing the load therebetween.
12. The anchoring device according to claim 1, further including ratchet means for holding a string to apply a force as desired, or for releasing the string to stop applying the force when it is no longer required.
13. The anchoring device according to claim 12, wherein the ratchet means include a self locking ratchet mechanism with means for manual or remote release of the string tension, or using other mechanisms such as springs.
14. A vacuum cup for anchoring surgery devices during surgery, comprising means for creating a vacuum inside the cup, and attaching means for attaching to surgical instruments or devices.
15. The vacuum cup according to claim 14, further including vacuum release means for allowing ambient fluid into the cup, when activated by a surgeon.
16. The vacuum cup according to claim 15, wherein the vacuum release means includes means for its activation using laparoscopic means.
17. The vacuum cup according to claim 15, wherein the vacuum release means includes flexible means which, when pressed or deformed, allows ambient fluid into the cup to cancel the vacuum there, when activated by a surgeon.

18. The vacuum cup according to claim 14, wherein vacuum is applied through a valve connected to vacuum generating means, and wherein the valve further includes means for holding it open by keeping a free passage for fluids whilst there is vacuum in the cup, and for automatically shutting itself by closing the fluids passage when there is no longer vacuum in the cup.
19. The vacuum cup according to claim 14, further including means for attaching a plurality of cups together for holding a larger weight or for distributing the load therebetween.
20. An electronically-controlled vacuum pump comprising vacuum pump means, timer means for activating the vacuum pump for a predefined time interval when receiving a trigger input, and indicator means for indicating to a surgeon that the vacuum is about to end.
21. The electronically-controlled vacuum pump according to claim 20, wherein the indicator means include a light or a buzzer or a combination thereof.
22. The electronically-controlled vacuum pump according to claim 20, further including a pump controller for controlling the degree of vacuum level as desired.
23. An anchoring device for surgery, comprising first attaching means for attaching the device to an internal surface within the human body and second attaching means for attaching to surgical instruments or devices, wherein the first attaching means comprise a wire piercing the abdominal wall for fixation thereto.
24. An anchoring method for surgery, comprising:
- A. attaching pulling means to the abdominal wall;
 - B. pulling the abdominal wall upwards, to lift the abdominal wall during atmospheric pressure (gassless) laparoscopy.
25. The anchoring method according to claim 24, wherein attaching pulling means to the abdominal wall using magnetic attraction.

26. The anchoring method according to claim 24, wherein attaching pulling means to the abdominal wall using wires piercing the entire thickness of the cavity.

27. The anchoring method according to claim 24, wherein performing an initial port using positive pressure laparoscopy, then attaching the attachment means to the undersurface of the cavity, to be subsequently used for endoscopic retraction and for retraction of the body wall, thus serving a dual role.

28. The anchoring method according to claim 24, wherein attaching the devices on the outer surface of the cavity to a frame or to rods fixed to the operating table, to the operating room floor or ceiling and serve for lifting the cavity wall, thus permitting to perform a surgical intervention without the necessity to insufflate the cavity with gas.